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# Testimony

**of Jonathan Cobb, Stratasys, Inc.**

*before the House Small Business Committee*

*on "The Rise of 3D Printing: Opportunities for Entrepreneurs"*

March 12, 2014





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Chairman Graves, Ranking Member Velázquez, and Committee Members, I am excited to have this opportunity to speak with you today on behalf of the National Association of Manufacturers and to share with you some background on 3D printing innovation, its role in reviving America's manufacturing industry, and how our company – Stratasys – is helping other small businesses grow and thrive in this economy.

My name is Jonathan Cobb and I am Executive Vice President of Corporate Affairs for Stratasys, which is based in Eden Prairie, Minnesota.

Stratasys is also a member of the National Association of Manufacturers (NAM) and I am honored to testify on behalf of the organization. The nation's largest manufacturing trade association, the NAM represents 12,000 member companies consisting of small and large manufacturers in every industrial sector and state. As the voice of manufacturers who employ 12 million men and women who work in manufacturing in America, the NAM is committed to achieving a policy agenda that helps manufacturers grow and create jobs.

In 2012, manufacturers contributed \$2.03 trillion to the economy; up from \$1.93 trillion in 2011. This represents 12.5 percent of our nation's GDP. Manufacturing supports an estimated 17.4 million jobs in the United States – about one in six private-sector jobs – and offers high-paying jobs. In 2011, the average manufacturing worker in the United States earned \$77,505 annually, including pay and benefits – 22 percent more than the rest of the workforce.

Manufacturers are also the world's leading innovators. Manufacturers in the United States perform two-thirds of all private-sector R&D in the nation, leading to more innovative breakthroughs than any other sector. I am proud to say that 3-D printing and Stratasys are part of that innovative leadership in the United States.

For many manufacturers in the United States, the economy is showing definite signs of improvement. Manufacturing has added about 600,000 jobs since the end of 2009, but it still has a long way to go. Manufacturing lost more than 2 million jobs during the past recession, and output remains below its 2007 peak.

Nearly 95 percent of all manufacturers in the United States have fewer than 100 employees, and the Small Business Administration (SBA) defines manufacturers with fewer than 500 employees as small. To compete on a global stage, manufacturing in the United States needs policies that enable companies to

thrive and create jobs. Growing manufacturing jobs will strengthen the U.S. middle class and continue to fuel America's economic recovery.

Because of the significant challenges affecting manufacturing, the NAM developed a strategy to enhance our growth. The NAM Growth Agenda: Four Goals for a Manufacturing Resurgence in America, is a policy blueprint for the Administration and Congress that sets four goals with bipartisan appeal for enhanced competitiveness and economic growth: (1) The United States will be the best place in the world to manufacture and attract foreign direct investment; (2) Manufacturers in the United States will be the world's leading innovators; (3) The United States will expand access to global markets to enable manufacturers to reach the 95 percent of consumers who live outside our borders; and (4) Manufacturers in the United States will have access to the workforce that the 21st-century economy demands. To achieve these goals, we need sound policies in taxation, energy, labor, trade, health care, education, litigation, and regulation.

You may be asking yourselves: "What is 3D printing and why should I care about it?"

Well, quite simply, 3D printing – otherwise known as "additive" manufacturing – is the process of creating a digital blueprint using Computer-Aided Design. These blueprints can also come from MRI, or scanned data. These digital files are then

sent to the 3D printer, which builds them from the ground up in very thin layers of plastic, metal, or other materials. The printing allows the creator to test for form, fit, and function.

With 3D printing technology, a user can take a digital design and turn it into a solid, tangible part within a matter of hours.

Although this concept may be new to many in this audience, the technology has actually existed for decades.

Our company was started in 1988 after our founders, Scott Crump and Lisa Crump, developed and patented the Fused Deposition Modeling (FDM) process. Scott Crump remains active with the company and serves as the Chairman of the Board.

3D printers were originally created to help engineers prove out their designs and perfect them before spending money on expensive factory tooling for production. This creates better quality products and allows companies to bring those products to market faster. Today, manufacturers are not just using the machines to produce prototypes. They are also using 3D printers for low-volume manufacturing of items from prosthetic limbs to the interior components of aircraft.

This brings up an important point that is relevant for this Committee: 3D printing will not replace traditional manufacturing processes but, rather, it serves as another “tool in the manufacturing toolbox” to complement how a good portion of manufacturers are delivering products to market in a more efficient and customized way.

Like the Internet in the 1990’s and smart phones in the last decade, 3D technology is becoming highly accessible, and poised to usher in a new world of “mass customization.”

As the industry is changing, our company is changing as well. In 2005, we started a separate business unit called RedEye, which allows people to acquire 3D printed parts. We also added Solidscape of Merrimack, NH, which helps jeweler designers and dental markets adopt 3D solutions.

Last year we merged with Brooklyn-based MakerBot, a 3D printing company whose user-friendly products are designed for entrepreneurs with basic technical skills. MakerBot’s growth since its inception in 2009 has allowed more small companies to receive the true benefit of 3D printing.

This growth in our business has helped other small businesses grow as well. When musician Chris Milnes was performing at events with his band, he used a popular credit card reader to collect sales proceeds for his band’s CDs and

merchandise. He loved the card reader, which plugged into his laptop, but he found that the product tended to spin when used instead of remaining stable, making it sometimes difficult to use. Using his children's Lego pieces, Chris built an accessory that kept the card reader stable. With a successful design, Chris wanted to bring this new innovation to market. But taking this prototype to production would have been costly and inefficient using traditional production methods. So instead, Chris invested in a consumer-level 3D printer, which has literally become a factory on his desk, enabling him to take his invention into production from his home for the cost of a couple thousand dollars.

We take pride in stories like this. To us, they demonstrate that we are not just in the business of producing 3D machines, we are also helping empower entrepreneurs by bringing manufacturing into their homes and workplaces.

Here's another small-business story, this time about a company that used a high-end Stratasys 3D printer to help get a product to market quickly and inexpensively.

When South Dakota-based Peppermint Energy set out to make a portable, plug-and-play solar generator, they needed more than just a blueprint on paper to see their product take shape. Using a 3D printer, Peppermint produced a physical and functional prototype that helped them identify design flaws and make

changes to the product quickly. By making these alterations with a 3D printer, Peppermint was able to save \$250,000 on tooling costs.

Despite the existence of 3D printing technology for decades, only in recent years has the price dropped enough to allow a new class of low-price systems to become accessible to everyday consumers and entrepreneurs. With that in mind, the best thing Washington can do right now is help the industry reach its full potential by encouraging further growth and investment.

Since 2002, nearly a quarter of Stratasys' business has been in education. By helping students learn design and manufacturing through 3D technology, we're helping schools build a strong hiring pool for businesses in America.

The NAM, Stratasys, and all manufacturers are working to address the need for a skilled workforce and therefore are focused on a number of STEM initiatives.

Stratasys, in particular, is a strong supporter of the STARBASE program, a STEM educational initiative that engages students – mostly 4<sup>th</sup> and 5<sup>th</sup> graders from inner city schools – in an intensive, five-day program in science, mathematics, and technology. STARBASE features a “Mission to Mars” theme that allows students to create a Mars colony. During the program, students get the greatest excitement and value from learning about a design concept in the classroom and turning that into reality by 3D printing several variants of their own tailfin design for a rocket that is launched on a field. Students also experience

first-hand the results of each set of tailfins and how they affect the rocket flight stability, trajectory, and height. It is a powerful and moving experience for young students, and for many, it can be an epiphany that they too could pursue an engineering career. This program relies on federal grants and we believe Congress should continue supporting STEM initiatives that will help grow and develop the next generation to lead the 3D printing revolution.

As you can tell from our presence here today, the interest in 3D printing is strong and the future is infinite for this technology. Despite our industry's long history, we are experiencing rapid growth that is giving domestic manufacturing a new global competitive edge. As President Obama noted in his recent speech touting additive manufacturing (3D printing) hubs, "If we want to attract more good manufacturing jobs to America, we've got to make sure we're on the cutting edge."

Our company could not agree more.

This is an industry that was started in the United States and is dominated by domestic businesses. We must continue to grow, innovate, and lead in this area.